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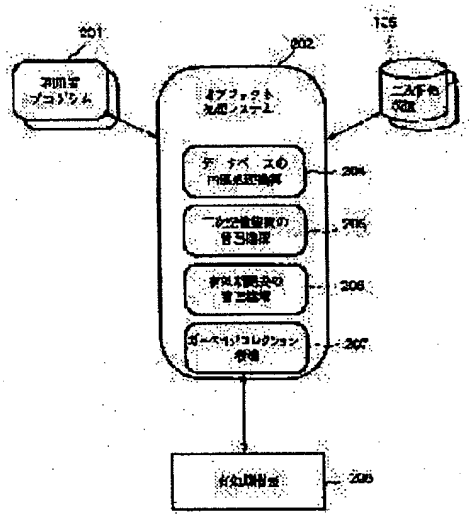
(54) INFORMATION MANAGING DEVICE AND ITS CONTROL METHOD

(57)Abstract:
PURPOSE: To reduce burden on a device or system and to suppress the increase of an unrequired object by storing a valid period of identification information which specifies the information of a registration object and the information of the registration object by corresponding to each other, and comparing stored information with the real time of the system, deleting registration information in an invalid period.
CONSTITUTION: When an object (information) is registered on a secondary memory device 105, the validity of the object is set. A pair of object identifier and validity is registered on a validity table 208 additionally. When the garbage processing of the object is performed, the validity of a permanet object is compared with the present time (including a date), and it is judged whether the object is within or outside the validity. When it is judged that the object is outside the validity, a corresponding permanent object is erased, and also, the corresponding part of the validity table 208 is deleted.



LEGAL STATUS

[Date of request for examination]

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* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
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CLAIMS

[Claim(s)]
[Claim 1] In the information management equipment which memorizes two or more information to predetermined storage, and manages it A period setting means to set up the shelf-life of the information concerned in case storage registration of the information is carried out, A storage means to match and memorize the shelf-life of the identification information which specifies the information for registration, and the information for [concerned] registration, Information management equipment characterized by having a deletion means to delete registration information which compares the information and the real time of day of a system which are memorized by this storage means, and is in an invalid period.
[Claim 2] In the control approach of information management equipment of memorizing two or more information to predetermined storage, and managing it The period setting process of setting up the shelf-life of the information concerned in case storage registration of the information is carried out, The storage process which matches and memorizes the shelf-life of the identification information which specifies the information for registration, and the information for [concerned] registration, The control approach of the information management equipment characterized by having the deletion process which deletes registration information which compares the information and the real time of day of a system which are memorized according to this storage process, and is in an invalid period.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to information management equipment and its control approach, the information management equipment that performs garbage processing of the object in a database in detail, and its control approach.
[0002]
[Description of the Prior Art] Usually, the garbage collection function of an object oriented database processes it by the background or the foreground, and it discovers the permanent object (garbage) which became unnecessary, and releases the information on the permanent objects (for example, a document, an image, etc.) from mass secondary storages, such as a hard disk and a magneto-optic disk, and he is trying to prepare the processing facility of dedication in database system, and to delete it from a database management list.
[0003]
[Problem(s) to be Solved by the Invention] However, in the above-mentioned conventional example, in order to act so that the garbage collection function of an object processing system may discover garbage and may perform release and deletion, there are the following problems.
[0004] (1) The processing for a garbage collection becomes the burden of a system.
[0005] (2) In order for the permanent object which can become the element of a compound object to judge whether it is garbage, it is necessary to inspect whether the element of this compound object is the element of other compound objects.
[0006] (3) As the compound object which consists of permanent objects judges whether it is garbage, in order to guarantee that the element and configuration of a compound object are not changed, it is necessary to perform transaction processing.
[0007] (4) When a garbage collection is automatically performed by the system, a user cannot know the time amount from which garbage is eliminated.
[0008] Furthermore, since a shelf-life was not able to be specified as the object of an object processing system, there were the following faults.
[0009] (5) A shelf-life cannot be specified to a permanent object effective only in a certain fixed period.
[0010] (6) To an unnecessary permanent object, it is necessary to delete clearly before this period at a certain fixed period.
[0011] (7) A user cannot specify the time of day which makes a change to the secondary storage for creating / eliminating a permanent object, and the table of a system.
[0012]
[Means for Solving the Problem] This invention tends to be made in view of this trouble, the burden placed on equipment or a system tends to be mitigated, and it is going to offer the information management equipment which makes it possible to control the increment in an unnecessary object, and its control approach.
[0013] In order to solve this technical problem, the information management equipment of this invention is equipped with the configuration shown below. Namely, memorize two or more information to predetermined storage, and it sets to the information management equipment to manage. A period setting means to set up the shelf-life of the information concerned in case storage registration of the information is carried out, A storage means to match and memorize the shelf-life of the identification information which specifies the information for registration, and the information for [concerned] registration is compared with the information and the real time of day of a system which are memorized by this storage means, and it has a deletion means to delete registration information in an invalid period.
[0014] Moreover, the control approach of the information management equipment of this invention is equipped with the process shown below. Namely, memorize two or more information to predetermined storage, and it sets to the control approach of the information management equipment to manage. The period setting process of setting up the shelf-life of the information concerned in case storage registration of the information is carried out, The storage process which matches and memorizes the shelf-life of the identification information which specifies the information for registration, and the information for [concerned] registration is compared with the information and the real time of day of a system which are memorized according to this storage process, and it has the deletion process which deletes registration information in an invalid period.
[0015]
[Function] In the configuration or process of this this invention, when it is going to register a certain information, the shelf-life of the information for [the] registration is set up. And storage maintenance of the pair of a shelf-life which had the identification information for [the] registration set up is carried out. And as compared with the real time of a system, it deletes about the information which is an invalid period based on this memorized information.
[0016]
[Example] The example which starts this invention according to a drawing below is explained to a detail.
[0017] Drawing 1 is the block diagram showing the configuration of the information processor of an example.
[0018] In this drawing, the arithmetic and program control (henceforth CPU) with which 101 controls input units, such as a keyboard and a mouse, and 102 controls the whole equipment, the main storage (following, RAM) which loads the program which

uses 103 by the system, and data, and 104 are read-only memories (ROM) which have memorized a boot program, font data, etc. which are performed at the time of starting of CPU102. 105 is a secondary storage (here, it considers as a hard disk drive unit) data and the database processing program of a database are remembered to be, and this program will be loaded to RAM103 and will be performed. 106 is output units, such as a terminal and a printer.
[0019] Drawing 2 is a configuration conceptual diagram in case the database program in the above-mentioned configuration is loaded to RAM103.
[0020] In this drawing, 201 is a shelf-life table (conversion table of an object and a shelf-life) where a user's program (a processing demand is performed to a database) and 202 are carried out at an object processing system (it consists of the internal-processing device 204 of a database, a control mechanism 205 of a secondary storage, a control mechanism 206 of a shelf-life table, and a garbage collection control mechanism 207), and storage maintenance of 208 is carried out into secondary storage 105, and is mentioned later for details.
[0021] In the above-mentioned configuration, CPU102 in drawing 1 and RAM103 grade constitute the object processing system 202 and a user's program 201.
[0022] Drawing 3 shows an example of the shelf-life table 208 in drawing 2 . In this drawing, "an object identifier (OID)" is the information for identifying the object in a system uniquely. Moreover, a "shelf-life" is time information which shows the shelf-life of a corresponding object, and holds the information which shows whether it is valid from when before when. That is, if it is within this period, a system guarantees existence of that object, the object outside that period regards it as a garbage object, and opening wide and deleting from secondary storage 105 is shown.
[0023] For example, the object of an object identifier "OID1" shows that 12:30 00 seconds on September 10, Heisei 2 after 30 minutes and 00 seconds are a shelf-life, and the information on this object is saved in a secondary storage 203 in this shelf-life at Narimoto Taira year 12:00 on April 17.
[0024] Moreover, it is shown that storage maintenance is carried out into a secondary storage 203 unless a shelf-life is effective and eliminates clearly in all periods, and the object of an object identifier "OID4" is not set as the object of a garbage collection.

[0025] In addition, about OID2 and OID3, I will guess easily from the above-mentioned explanation.
[0026] The information on the shelf-life table 208 of drawing 2 may be saved apart from the data of a permanent object at the secondary storage 203 of drawing 2 , and may save the information on front [whole] as one certain permanent object at a secondary storage 203. Moreover, you may save for every permanent object as information in each permanent object at a secondary storage 203.
[0027] Moreover, you may make it the information on the shelf-life table 208 specify only the time of day which omits and eliminates the first time of day. In this case, the time of day which writes in the information on a new object into a secondary storage 203 (registration) cannot be specified.
[0028] Now, in the above-mentioned configuration, although the well-known additional information (information on a keyword, an implementer, or others) over an object is attached in case new data (object) are registered into a system, at this time, a user directs the input of the shelf-life to that object (if), and directs a registration request to a system.
[0029] Drawing 4 shows the procedure of the system which received this registration request.
[0030] It confirms whether specify the shelf-life of an object that the creation demand of a permanent object occurs (decision step S402). (step S401) When the shelf-life of an object is not specified, the default value of a system is used (step S403). (when it is NO) For example, a certain fixed period can also be made into the shelf-life of this object for the default value of a system from creation time. Moreover, for example, it can also consider as a shelf-life (- infinity-+infinity) which does not delete the default value of a system eternally. A user (only user allowed especially) may be made to set up such default value freely by the configuration of a system, and a user may be made to set up each default value.
[0031] Next, a new OID identifier is obtained based on the number of the object identifier OID generated in the past (step S404). And additional registration of the group of the object identifier OID and above-mentioned shelf-life is carried out in the shelf-life table 208 (step S405).
[0032] Next, the object information which a permanent object has is written in into a secondary storage 203 (step S406).
[0033] Finally, a ** value is returned to the creation demand origin of a permanent object (step S407). This return value is information which shows whether whether only the capacity which memorizes an object having been secured to secondary storage 105, and processings progressed normally.
[0034] In the database of an example, OID and its shelf-life information will be created by each object in principle the above result.
[0035] Next, the contents of garbage collection processing in an example are explained according to the flow chart of drawing 5 .

[0036] First, the above-mentioned garbage collection device 207 chooses as the beginning one permanent object which can become garbage (step S501). For example, the table (table which the internal-processing device 204 of the above-mentioned database manages) which consists of the object identifier OID which the above-mentioned object processing system 202 manages may be searched, every one object identifier OID may be chosen in order, and every one direct object identifier OID may be chosen from the above-mentioned shelf-life table 208 in order (case 2). (case 1)
[0037] Next, the above-mentioned shelf-life table 208 is searched from the object identifier OID of the permanent object concerned, and the shelf-life of the object is read (step S502).
[0038] And the shelf-life of the permanent object concerned is compared with the current time of day (naturally the date is also contained) which the system holds, and it judges whether the object is outside a shelf-life, or it is inside (step S503).
[0039] When it is judged that it is outside a shelf-life (in the case of YES), while eliminating the corresponding permanent object, the applicable part of the shelf-life table 208 is also deleted.
[0040] When having not passed over the shelf-life (in the case of NO), it ends as it is.
[0041] Like the above, it has the information each object indicates an own shelf-life to be, the burden concerning a system becomes small according to this example, by having the information which specifies each object, and the information on the dedication which consists of pairs of a shelf-life (file), and it becomes possible to discover an unnecessary object simply quickly.

And it becomes, without a garbage object increasing carelessly.
[0042] In addition, although the shelf-life table 208 was made to memorize the pair of Object ID and its shelf-life, you may make it include the information which shows an object name and its existence location in it in the above-mentioned example. In this case, although the amount of information of the shelf-life table 208 increases somewhat as compared with the above-mentioned example, processing which discovers an object is made to a high speed.
[0043] The shelf-life table 208 of drawing 2 is not used for the shelf-life of the explanation > [example 2] object of an example besides <, but a shelf-life is specified in the data of each permanent object. The garbage collection device 207 of an object processing system reads a shelf-life from each permanent object, and sets only the object which passed over the expiration date as the object of a garbage collection. The garbage collection device 207 can mitigate garbage collection processing, although some processing speed is inferior as compared with the above-mentioned example, since a shelf-life is investigated first, and the object within an expiration date does not regard it as garbage but it moves to investigation of the following object.
[0044] In [example 3] drawing 4 , when not specifying the shelf-life of an object, the default of a system is made "with no shelf-life". [explicit]
[0045] For example, in "having no shelf-life", nothing can be written in the shelf-life table 208. In this case, it also becomes possible to control that the shelf-life table 208 becomes large. Furthermore, since the object of "having no shelf-life" is automatically excepted from the object of garbage when the garbage collection device 207 chooses the object identifier OID from the shelf-life table 208 first as an object of garbage (above "a case 2"), an object to except from the object of garbage can be created as "with no effectiveness."
[0046] Moreover, for example, in "having no shelf-life", only the information which shows "he has no shelf-life" can be written in the above-mentioned shelf-life table 208. It can be decided now at the time of garbage collection processing whether the garbage collection device 207 sets the permanent object of "having no shelf-life" as the object of garbage. In this case, even if it does not set up the shelf-life of an object clearly, it will be decided at the time of garbage collection processing whether it is garbage.
[0047] In [example 4] drawing 4 , when not specifying the shelf-life of an object, the default of each class may be used. For example, if an object is created without specifying a shelf-life, a certain fixed period will turn into a shelf-life of this object from creation time. Since a default is changeable for every class, fine control is attained. The default of a class is made to adjustable as a class variable. Moreover, if a class object is made into a permanent object, it saves at a secondary storage 203 and the shelf-life of the class object itself passes, all the instances of this class can be treated as garbage. Moreover, if the shelf-life of a class object is set up so that the period containing the shelf-lives of all the instances of this class may come, a class object will also become garbage treatment while all the instances of this class become garbage treatment.
[0048] the database which makes the version of a [example 5] class plurality and treats a schema — setting — the difference of each class — in case this class object is deleted when only information and the information on the first version are memorized, and the shelf-life of the class object of a certain version passes, the class object of the old version of the version or earlier of this class object is merged, and you may make it maintain the adjustment of a schema
[0049] "In the example 6] example 5, a class version number may be used instead of the shelf-life of a class object, when a number with a version is exceeded, the class object before this version may be merged, and the instance of an unnecessary class object and an unnecessary class may be eliminated. The greatest version number can be specified for every schema. When not specifying, it is made also to the default of a system and is made also to the default for every schema.
[0050] In case each class object is deleted in t the time of the shelf-life of the class set in the "example 7" example 5 passing, a shelf-life is inspected about all the class objects of a version older than the version of this class object, and only when all shelf-lives are before t, merge and deletion are performed.
[0051] In a "example 8" compound object, in case the shelf-life of a compound object is specified, a shelf-life may be inspected about all the objects that are the elements of this compound object, the shelf-life I containing the shelf-life of all elements and the shelf-life of this compound object may be calculated, and the shelf-life of all elements and the shelf-life of this compound object may be set as this shelf-life I. Thus, since the shelf-life of all the elements of a compound object and the shelf-life of this compound object become equal, in the case of a garbage judging, it becomes unnecessary to inspect a shelf-life about all the objects that are the elements of this compound object, and they can eliminate a compound object and all elements to coincidence.
[0052] In the [example 9] example 8, when the shelf-life of a compound object is not specified, it is good also considering the shelf-life which inspects a shelf-life about all the objects that are the elements of this compound object, and contains all shelf-lives as a shelf-life of this compound object.
[0053] In the [example 10] example 8, in case an element object is registered into a compound object, it is good also considering the shelf-life which inspects the shelf-life of this element object and contains all shelf-lives as a shelf-life of this compound object and this element object.
[0054] [Example 11] When in the case of the system which writes the information on a database in a secondary storage 203 for every fixed period of a certain the shelf-life of a permanent object tends to be written in, it is going to specify before a time and it is going to create this object, this permanent object is created as a temporary object which exists only in main storage 103, and you may make it not write in a secondary storage 203 and the shelf-life table 208. Thus, useless write-in processing can be saved now.
[0055] the time of memorizing to a different secondary storage 203 for every shelf-life of an object in the case of a system with two or more [example 12] secondary storages 203, and passing over a certain period — a secondary storage 203 — you may make it eliminate all information For example, a secondary storage 203 can also be initialized physically. Moreover, overwrite can also only be altogether made possible as meaningless information, without eliminating the information on a secondary storage 203. In this example, T which consists of "an identifier of a secondary storage and a shelf-life" by the whole system is prepared. In case the shelf-life table 208 is prepared every secondary storage 203 and an object is saved at a secondary storage 203 When a shelf-life I1 is read from this table T and the shelf-life I2 of this object is contained at this shelf-life I1 It writes in this secondary storage, and when not contained, I1 from which the shelf-life I3 containing these shelf-lives I1 and I2 becomes min is calculated, an object is written in a corresponding secondary storage, and TI1 is changed into this tableI3. Thus, a KABEJI

processor can read a shelf-life and can eliminate it now from this table T per secondary storage. In this example, since it eliminates per secondary storage, the shelf-life table 208 is also eliminated by coincidence.
[0056] In the [example 13] example 12, in the case of the system which divides and uses a secondary storage 203 for two or more partitions, it is a partition unit instead of a secondary-storage unit, and when it memorizes to a different partition for every shelf-life of each object and passes over a certain period, the information on these all partitions is eliminated. Moreover, overwrite can also only be altogether made possible as meaningless information, without eliminating the information on a partition.
[0057] Other databases are considered although this invention described the object oriented database.
[0058] In addition, even if it applies this invention to the system which consists of two or more devices, it may be applied to the equipment which consists of one device. Moreover, it cannot be overemphasized that this invention can be applied also when attained by supplying a program to a system or equipment.
[0059]
[Effect of the Invention] As explained above, the burden which is placed on a system according to this invention is mitigated, and it becomes possible to control the increment in an unnecessary object (information).
[0060]

[Translation done.]

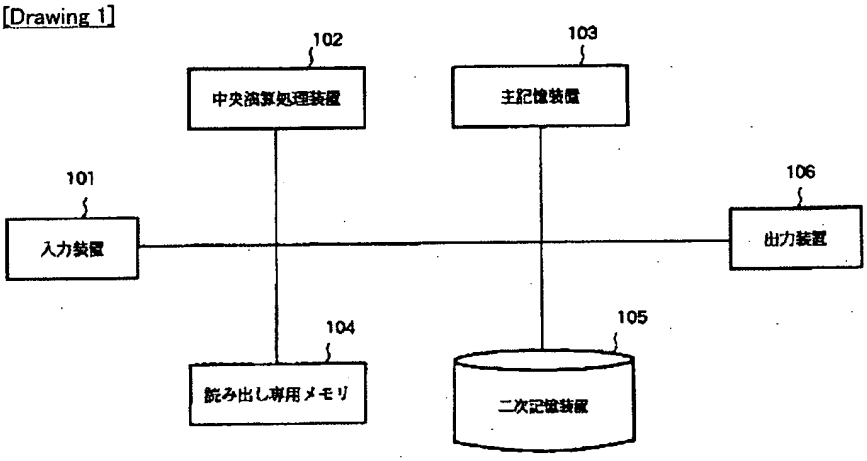
DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the block block diagram showing the configuration of the information processor of an example.
[Drawing 2] It is the configuration conceptual diagram of the information processor of an example.
[Drawing 3] It is drawing showing the contents of the shelf-life table in an example.
[Drawing 4] It is the flow chart which shows a part of procedure of creation of the permanent object in an example, and the procedure of registration.
[Drawing 5] It is the flow chart which shows the contents of the processing to which a garbage collection device chooses and eliminates garbage out of a permanent object.
[Description of Notations]
1 User Program (Processing Demand is Performed to Database)
2 Object processing system (internal processing of a database is performed.) A secondary storage and a shelf-life are managed and garbage is eliminated.
3 Secondary Storage (Data of Database are Saved)
4 Shelf-life Table (Conversion Table of Object and Shelf-life)

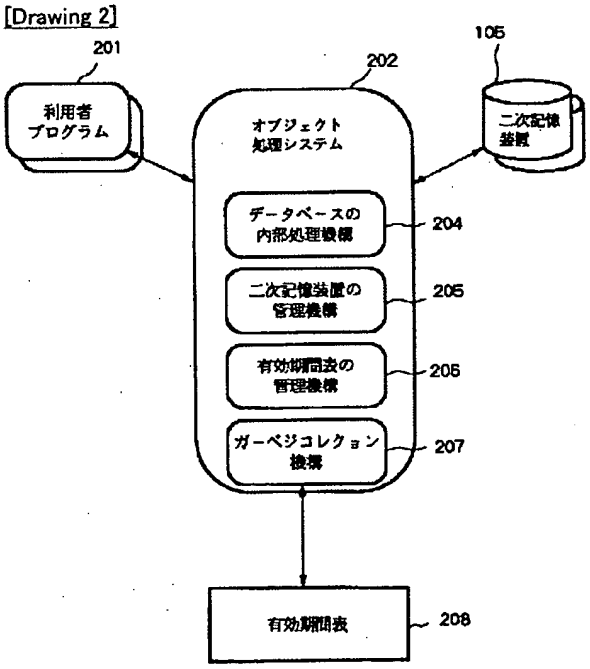
[Translation done.]

DRAWINGS

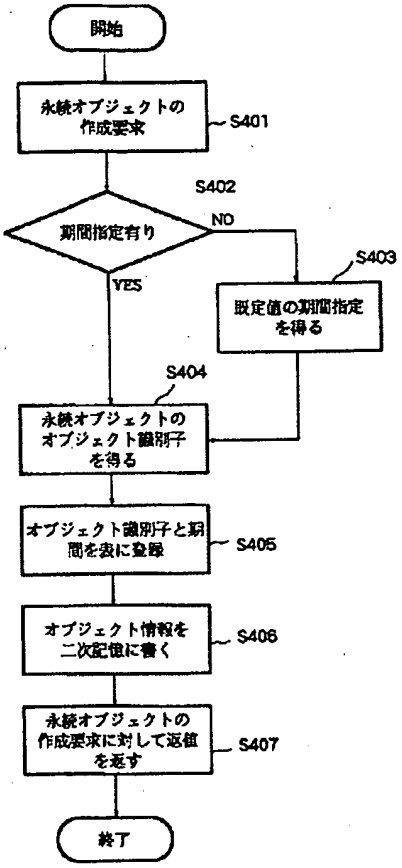
[Drawing 1]



[Drawing 2]



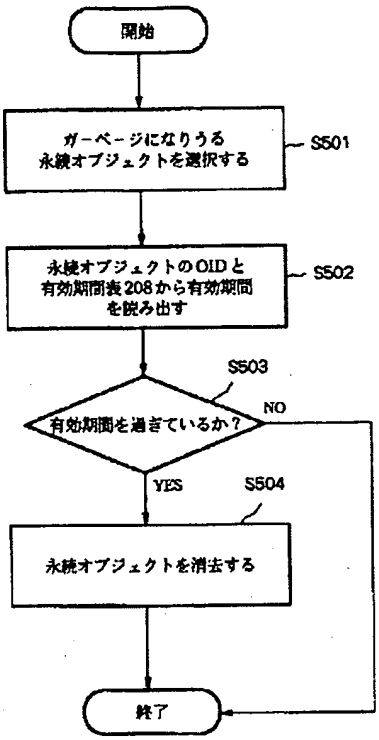
[Drawing 4]



[Drawing 3]

オブジェクト識別子	有効期間
OID1	平1年5月1日12時30分00秒～平3年7月1日12時30分00秒
OID2	－∞ ～平2年6月30日12時30分00秒
OID3	平9年5月1日22時30分00秒～＋∞
OID4	－∞～＋∞

[Drawing 5]



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WRITTEN AMENDMENT

---------- [a procedure revision]
[Filing Date] May 9, Heisei 6
[Procedure amendment 1]
[Document to be Amended] Specification
[Item(s) to be Amended] Whole sentence
[Method of Amendment] Modification
[Proposed Amendment]
[Document Name] Specification
[Title of the Invention] Information management equipment and its control approach
[Claim(s)]
[Claim 1] In the information management equipment which memorizes two or more information to predetermined storage, and manages it,
A period setting means to set up the shelf-life of the information concerned in case storage registration of the information is carried out,
A storage means to match and memorize the shelf-life of the identification information which specifies the information for registration, and the information for [concerned] registration,
Information management equipment characterized by having a deletion means to delete registration information which compares the information and the real time of day of a system which are memorized by this storage means, and is in an invalid period.
[Claim 2] In the control approach of information management equipment of memorizing two or more information to predetermined storage, and managing it,
The period setting process of setting up the shelf-life of the information concerned in case storage registration of the information is carried out,
The storage process which matches and memorizes the shelf-life of the identification information which specifies the information for registration, and the information for [concerned] registration,
The control approach of the information management equipment characterized by having the deletion process which deletes registration information which compares the information and the real time of day of a system which are memorized according to this storage process, and is in an invalid period.
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[0006] (3) As the compound object which consists of permanent objects judges whether it is garbage, in order to guarantee that the element and configuration of a compound object are not changed, it is necessary to perform transaction processing.
[0007] (4) When a garbage collection is automatically performed by the system, a user cannot know the time amount from which garbage is eliminated.
[0008] Furthermore, since a shelf-life was not able to be specified as the object of an object processing system, there were the following faults.
[0009] (5) A shelf-life cannot be specified to a permanent object effective only in a certain fixed period.
[0010] (6) To an unnecessary permanent object, it is necessary to delete clearly before this period at a certain fixed period.
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[0012]
[Means for Solving the Problem] This invention tends to be made in view of this trouble, the burden placed on equipment or a system tends to be mitigated, and it is going to offer the information management equipment which makes it possible to control the increment in an unnecessary object, and its control approach.
[0013] In order to solve this technical problem, the information management equipment of this invention is equipped with the configuration shown below. Namely, memorize two or more information to predetermined storage, and it sets to the information management equipment to manage. A period setting means to set up the shelf-life of the information concerned in case storage registration of the information is carried out. A storage means to match and memorize the shelf-life of the identification information which specifies the information for registration, and the information for [concerned] registration is compared with the information and the real time of day of a system which are memorized by this storage means, and it has a deletion means to delete registration information in an invalid period.
[0014] Moreover, the control approach of the information management equipment of this invention is equipped with the process shown below. Namely, memorize two or more information to predetermined storage, and it sets to the control approach of the information management equipment to manage. The period setting process of setting up the shelf-life of the information concerned in case storage registration of the information is carried out, The storage process which matches and memorizes the shelf-life of the identification information which specifies the information for registration, and the information for [concerned] registration is compared with the information and the real time of day of a system which are memorized according to this storage process, and it has the deletion process which deletes registration information in an invalid period.
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[0018] In this drawing, the arithmetic and program control (henceforth CPU) with which 101 controls input units, such as a keyboard and a mouse, and 102 controls the whole equipment, the main storage (following, RAM) which loads the program which uses 103 by the system, and data, and 104 are read-only memories (ROM) which have memorized a boot program, font data, etc. which are performed at the time of starting of CPU102. 105 is secondary storages (for example, a hard disk drive unit, optical-magnetic disc equipment, etc.) data and the database processing program of a database are remembered to be, and this program will be loaded to RAM103 and will be performed. 106 is output units, such as a terminal and a printer.
[0019] Drawing 2 is a configuration conceptual diagram in case the database program in the above-mentioned configuration is loaded to RAM103.
[0020] In this drawing, 201 is a shelf-life table (conversion table of an object and a shelf-life) where a user's program (a processing demand is performed to a database) and 202 are carried out at an object processing system (it consists of the internal-processing device 204 of a database, a control mechanism 205 of a secondary storage, a control mechanism 206 of a shelf-life table, and a garbage collection device 207), and storage maintenance of 208 is carried out into the secondary storage 105, and is mentioned later for details.
[0021] In the above-mentioned configuration, CPU102 in drawing 1 and RAM103 grade constitute the object processing system 202 and a user's program 201.
[0022] Drawing 3 shows an example of the shelf-life table 208 in drawing 2 . In this drawing, "an object identifier (OID)" is the information for identifying the object in a system uniquely. Moreover, a "shelf-life" is time information which shows the shelf-life of a corresponding object, and holds the information which shows whether it is valid from when before when. That is, if it is within this period, a system guarantees existence of that object, the object outside that period regards it as a garbage object, and opening wide and deleting from a secondary storage 105 is shown.
[0023] For example, the object of an object identifier "OID1" shows that 12:30 00 seconds on September 10, Heisei 2 after 30 minutes and 00 seconds are a shelf-life, and the information on this object is saved in a secondary storage 105 in this shelf-life at Narimoto Taira year 12:00 on April 17.
[0024] Moreover, it is shown that storage maintenance is carried out into a secondary storage 105 unless a shelf-life is effective and eliminates clearly in all periods, and the object of an object identifier "OID4" is not set as the object of a garbage collection.

[0025] In addition, about OID2 and OID3, I will guess easily from the above-mentioned explanation.
[0026] The information on the shelf-life table 208 of drawing 2 may be saved apart from the data of a permanent object at the secondary storage 105 of drawing 2 , and may save the information on front [whole] as one certain permanent object at a secondary storage 105. Moreover, you may save for every permanent object as information in each permanent object at a secondary storage 105.
[0027] Moreover, you may make it the information on the shelf-life table 208 specify only the time of day which omits and eliminates the first time of day. In this case, the time of day which writes in the information on a new object into a secondary storage 105 (registration) cannot be specified.
[0028] Now, in the above-mentioned configuration, although the well-known additional information (information on a keyword, an implementer, or others) over an object is attached in case new data (object) are registered into a system, at this time, a user directs the input of the shelf-life to that object (if), and directs a registration request to a system.
[0029] Drawing 4 shows the procedure of the system which received this registration request.
[0030] It confirms whether specify the shelf-life of an object that the creation demand of a permanent object occurs (decision step S402). (step S401) When the shelf-life of an object is not specified, the default value of a system is used (step S403). (when it is NO) For example, a certain fixed period can also be made into the shelf-life of this object for the default value of a system from creation time. Moreover, for example, it can also consider as a shelf-life (- infinity--infinity) which does not delete

the default value of a system eternally. A user (only user allowed especially) may be made to set up such default value freely by the configuration of a system, and a user may be made to set up each default value.

[0031] Next, a new OID identifier is obtained based on the number of the object identifier OID generated in the past (step S404). And additional registration of the group of the object identifier OID and above-mentioned shelf-life is carried out in the shelf-life table 208 (step S405).

[0032] Next, the object information which a permanent object has is written in into a secondary storage 105 (step S406).

[0033] Finally, a ** value is returned to the creation demand origin of a permanent object (step S407). This return value is information which shows whether whether only the capacity which memorizes an object having been secured to the secondary storage 105, and processings progressed normally.

[0034] In the database of an example, the object identifier OID and its shelf-life information will be created by each object in principle the above result.

[0035] Next, the contents of garbage collection processing in an example are explained according to the flow chart of drawing 5 .

[0036] First, the above-mentioned garbage collection device 207 chooses as the beginning one permanent object which can become garbage (step S501). For example, the table (table which the internal-processing device 204 of the above-mentioned database manages) which consists of the object identifier OID which the above-mentioned object processing system 202 manages may be searched, every one object identifier OID may be chosen in order, and every one direct object identifier OID may be chosen from the above-mentioned shelf-life table 208 in order (case 2). (case 1)

[0037] Next, the above-mentioned shelf-life table 208 is searched from the object identifier OID of the permanent object concerned, and the shelf-life of the object is read (step S502).

[0038] And the shelf-life of the permanent object concerned is compared with the current time of day (naturally the date is also contained) which the system holds, and it judges whether the object is outside a shelf-life, or it is inside (step S503).

[0039] When it is judged that it is outside a shelf-life (in the case of YES), while eliminating the corresponding permanent object, the applicable part of the shelf-life table 208 is also deleted.

[0040] When having not passed over the shelf-life (in the case of NO), it ends as it is.

[0041] Like the above, it has the information each object indicates an own shelf-life to be, the burden concerning a system becomes small according to this example, by having the information which specifies each object, and the information on the dedication which consists of pairs of a shelf-life (table), and it becomes possible to discover an unnecessary object simply quickly. And it becomes, without a garbage object increasing carelessly.

[0042] In addition, although the shelf-life table 208 was made to memorize the pair of the object identifier OID and its shelf-life, you may make it include the information which shows an object name and its existence location in it in the above-mentioned example. In this case, although the amount of information of the shelf-life table 208 increases somewhat as compared with the above-mentioned example, processing which discovers an object is made to a high speed.

[0043] Explanation [of an example besides <] >

The shelf-life table 208 of drawing 2 is not used for the shelf-life of a [example 2] object, but a shelf-life is specified in the data of each permanent object. The garbage collection device 207 of an object processing system reads a shelf-life from each permanent object, and sets only the object which passed over the expiration date as the object of a garbage collection. The garbage collection device 207 can mitigate garbage collection processing, although some processing speed is inferior as compared with the above-mentioned example, since a shelf-life is investigated first, and the object within an expiration date does not regard it as garbage but it moves to investigation of the following object.

[0044] In [example 3] drawing 4 , when not specifying the shelf-life of an object, the default of a system is made "with no shelf-life". [explicit]

[0045] For example, in "having no shelf-life", nothing can be written in the shelf-life table 208. In this case, it also becomes possible to control that the shelf-life table 208 becomes large. Furthermore, since the object of "having no shelf-life" is automatically excepted from the object of garbage when the garbage collection device 207 chooses the object identifier OID from the shelf-life table 208 first as an object of garbage (above "a case 2"), an object to except from the object of garbage can be created as "with no effectiveness."

[0046] Moreover, for example, in "having no shelf-life", only the information which shows "he has no shelf-life" can be written in the above-mentioned shelf-life table 208. It can be decided now at the time of garbage collection processing whether the garbage collection device 207 sets the permanent object of "having no shelf-life" as the object of garbage. In this case, even if it does not set up the shelf-life of an object clearly, it will be decided at the time of garbage collection processing whether it is garbage.

[0047] In [example 4] drawing 4 , when not specifying the shelf-life of an object, the default of each class may be used. For example, if an object is created without specifying a shelf-life, a certain fixed period will turn into a shelf-life of this object from creation time. Since a default is changeable for every class, fine control is attained. The default of a class is made to adjustable as a class variable. Moreover, if a class object is made into a permanent object, it saves at a secondary storage 105 and the shelf-life of the class object itself passes, all the instances of this class can be treated as garbage. Moreover, if the shelf-life of a class object is set up so that the period containing the shelf-lives of all the instances of this class may come, a class object will also become garbage treatment while all the instances of this class become garbage treatment.

[0048] the database which makes the version of a [example 5] class plurality and treats a schema — setting — the difference of each class — in case this class object is deleted when only information and the information on the first version are memorized, and the shelf-life of the class object of a certain version passes, the class object of the old version of the version or earlier of this class object is merged, and you may make it maintain the adjustment of a schema

[0049] "In the example 6] example 5, a class version number may be used instead of the shelf-life of a class object, when a number with a version is exceeded, the class object before this version may be merged, and the instance of an unnecessary class object and an unnecessary class may be eliminated. The greatest version number can be specified for every schema. When not specifying, it is made also to the default of a system and is made also to the default for every schema.

[0050] In case each class object is deleted in t the time of the shelf-life of the class set in the "example 7" example 5 passing,

a shelf-life is inspected about all the class objects of a version older than the version of this class object, and only when all shelf-lives are before said t, merge and deletion are performed.

[0051] In a "example 8" compound object, in case the shelf-life of a compound object is specified, a shelf-life may be inspected about all the objects that are the elements of this compound object, the shelf-life I containing the shelf-life of all elements and the shelf-life of this compound object may be calculated, and the shelf-life of all elements and the shelf-life of this compound object may be set as this shelf-life I. Thus, since the shelf-life of all the elements of a compound object and the shelf-life of this compound object become equal, in the case of a garbage judging, it becomes unnecessary to inspect a shelf-life about all the objects that are the elements of this compound object, and they can eliminate a compound object and all elements to coincidence.

[0052] In the [example 9] example 8, when the shelf-life of a compound object is not specified, it is good also considering the shelf-life which inspects a shelf-life about all the objects that are the elements of this compound object, and contains all shelf-lives as a shelf-life of this compound object.

[0053] In the [example 10] example 8, in case an element object is registered into a compound object, it is good also considering the shelf-life which inspects the shelf-life of this element object and contains all shelf-lives as a shelf-life of this compound object and this element object.

[0054] [Example 11] When in the case of the system which writes the information on a database in a secondary storage 105 for every fixed period of a certain the shelf-life of a permanent object tends to be written in, it is going to specify before a time and it is going to create this object, this permanent object is created as a temporary object which exists only in main storage 103, and you may make it not write in a secondary storage 105 and the shelf-life table 208. Thus, useless write-in processing can be saved now.

[0055] the time of memorizing to a different secondary storage 105 for every shelf-life of an object in the case of a system with two or more [example 12] secondary storages 105, and passing over a certain period — a secondary storage 105 — you may make it eliminate all information For example, a secondary storage 105 can also be initialized physically. Moreover, overwrite can also only be altogether made possible as meaningless information, without eliminating the information on a secondary storage 105. In this example, Table T which consists of "an identifier of a secondary storage and a shelf-life" by the whole system is prepared. In case the shelf-life table 208 is prepared every secondary storage 105 and an object is saved at a secondary storage 105 When a shelf-life I1 is read from this table T and the shelf-life I2 of this object is contained at this shelf-life I1 It writes in this secondary storage, and when not contained, I1 from which the shelf-life I3 containing these shelf-lives I1 and I2 becomes min is calculated, an object is written in a corresponding secondary storage, and TI1 is changed into this tableI3. Thus, a car BEIJI processor can read a shelf-life and can eliminate it now from this table T per secondary storage. In this example, since it eliminates per secondary storage, the shelf-life table 208 is also eliminated by coincidence.

[0056] In the [example 13] example 12, in the case of the system which divides and uses a secondary storage 105 for two or more partitions, it is a partition unit instead of a secondary-storage unit, and when it memorizes to a different partition for every shelf-life of each object and passes over a certain period, the information on these all partitions is eliminated. Moreover, overwrite can also only be altogether made possible as meaningless information, without eliminating the information on a partition.

In [example 14] drawing 4 , in case the shelf-life of a permanent object is specified, the first time of day t1 is omitted, and when only the time of day t2 to eliminate is specified, the first time of day t1 is automatically set as the real time rt of a system. Since the first time of day t1 is omitted and a permanent object can be created, creation processing can be simplified. When it specifies that the time of day t2 to eliminate becomes before rather than the real time rt of a system in this example (t2 <=rt) May return the ** value which terminates creation processing of an object abnormally and shows abnormalities, and (case 3) Continue creation processing of an object then and do not write in main storage 103, even if like (it creates as a temporary object), it is good, and (case 4) Creation processing of a permanent object may be then continued, an object may be created to main storage 103, it may write in the shelf-life table 208 and a secondary storage 105, and you may eliminate as garbage in the case of garbage processing (case 5).

In [example 15] drawing 4 , in case the shelf-life of a permanent object is specified, when the first time of day t1 is specified that henceforth comes rather than the real time rt of a system (t1 >=rt), creation processing of an object is continued as it is, without terminating creation processing of an object abnormally. Since the permanent object which becomes henceforth more effective than the real time rt of a system can be specified, a permanent object effective only in a certain fixed period can be created. In this example, although an object is created to the creation time of an object at main storage 105 [when / at which it does not write in the shelf-life table 208 and a secondary storage 105 / it was made like (it creates as a temporary object) and the real time rt of a system was in agreement with the time of day t1 of the above-mentioned beginning] It may be made to write in the shelf-life table 208 and a secondary storage 105, and an object is created to the creation time of an object at main storage 103 (case 6), and you may make it write in the shelf-life table 208 and a secondary storage 105 (case 7). It may consider that the permanent object concerned is garbage, and the garbage collection device 207 may eliminate it, and you may make it not eliminate it in a case 7, without regarding it as garbage, since it can set up so that the time of day t1 of the beginning of a shelf-life may become henceforth rather than the real time rt of a system until a shelf-life expires.

[0057] Other databases are considered although this invention described the object oriented database.

[0058] In addition, even if it applies this invention to the system which consists of two or more devices, it may be applied to the equipment which consists of one device. Moreover, it cannot be overemphasized that this invention can be applied also when attained by supplying a program to a system or equipment.

[0059]

[Effect of the Invention] As explained above, the burden which is placed on a system according to this invention is mitigated, and it becomes possible to control the increment in an unnecessary object (information).

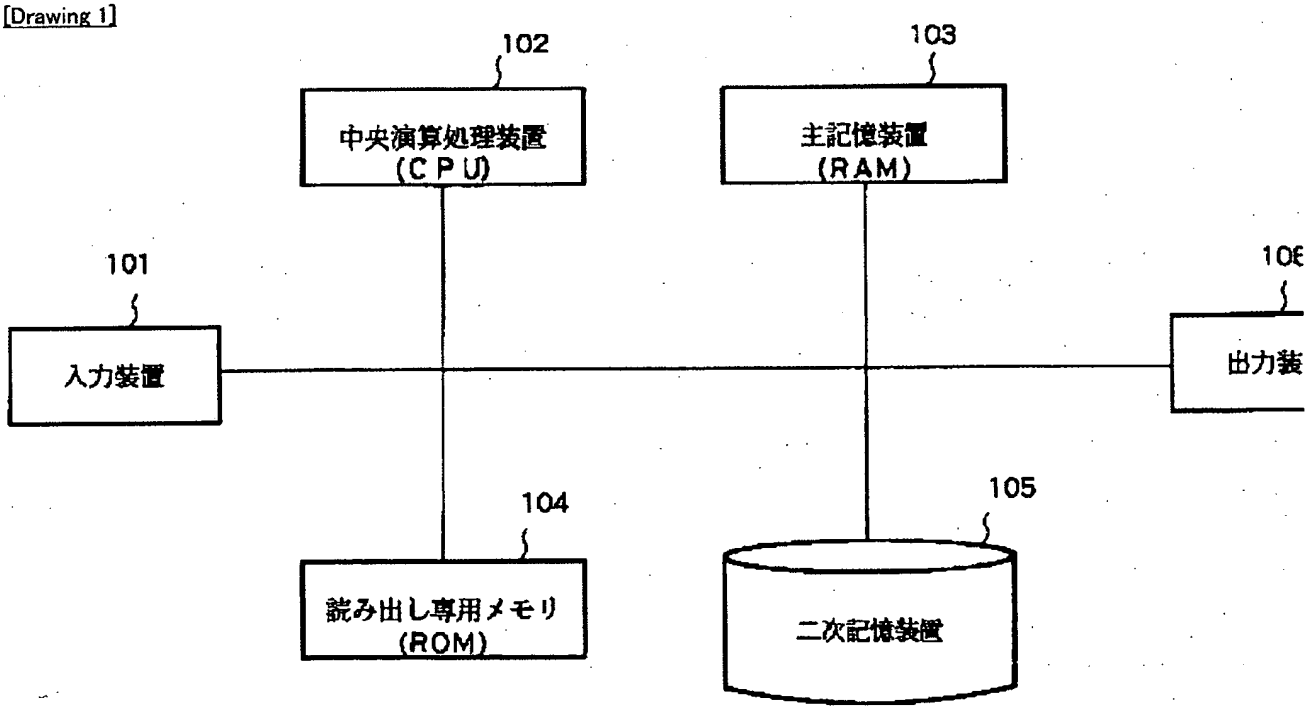
[0060]

[Brief Description of the Drawings]

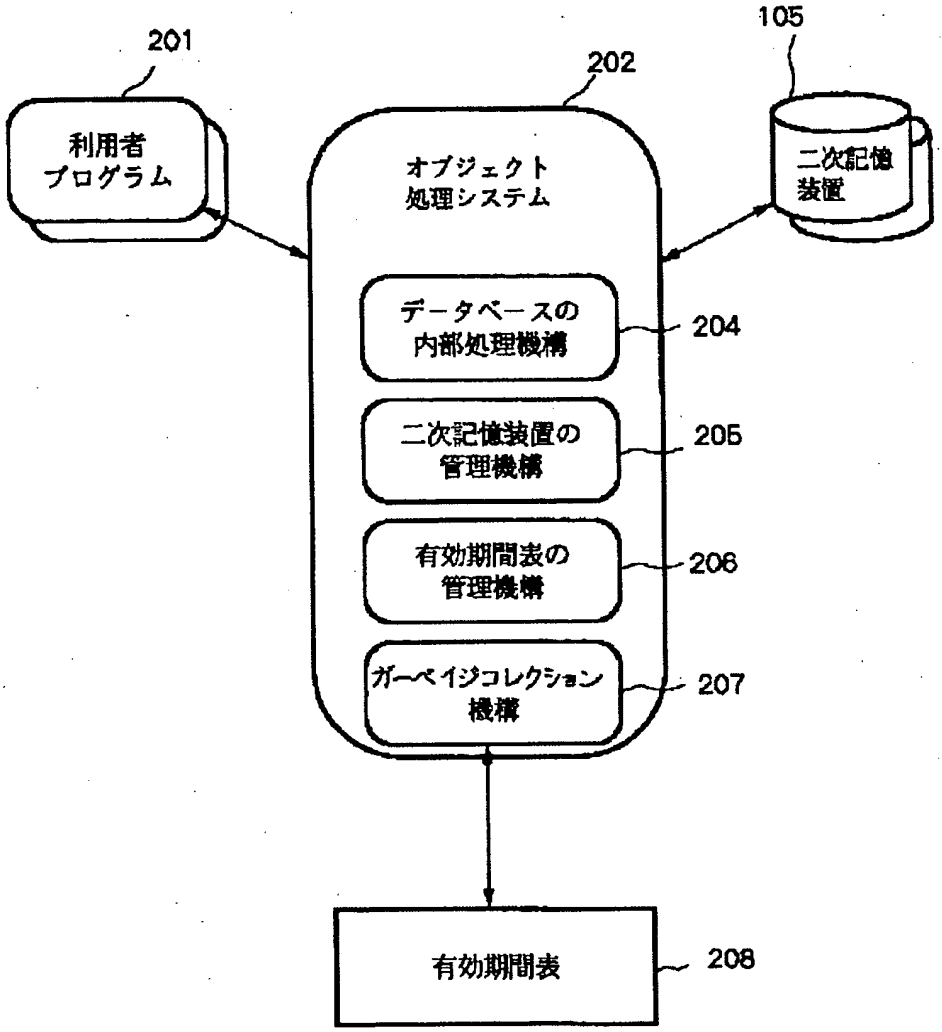
[Drawing 1] It is the block block diagram showing the configuration of the information processor of an example.

[Drawing 2] It is the configuration conceptual diagram of the information processor of an example.

[Drawing 3] It is drawing showing the contents of the shelf-life table in an example.
[Drawing 4] It is the flow chart which shows a part of procedure of creation of the permanent object in an example, and the procedure of registration.
[Drawing 5] It is the flow chart which shows the contents of the processing to which a garbage collection device chooses and eliminates garbage out of a permanent object.
[Description of Notations]
101 Input Unit
102 Arithmetic and Program Control (CPU)
103 Main Storage (RAM)
104 Read-only Memory (ROM)
105 Secondary Storage (Data of Database are Saved)
106 Output Unit
201 User Program (Processing Demand is Performed to Database)
202 Object processing system (internal processing of a database is performed.) A secondary storage and a shelf-life are managed and garbage is eliminated.
204 Internal-Processing Device of Database
205 Control Mechanism of Secondary Storage
206 Control Mechanism of Shelf-life Length
207 Garbage Collection Device
208 Shelf-life Table (Conversion Table of Object and Shelf-life)
[Procedure amendment 2]
[Document to be Amended] DRAWINGS
[Item(s) to be Amended] drawing 1
[Method of Amendment] Modification
[Proposed Amendment]
[Drawing 1]



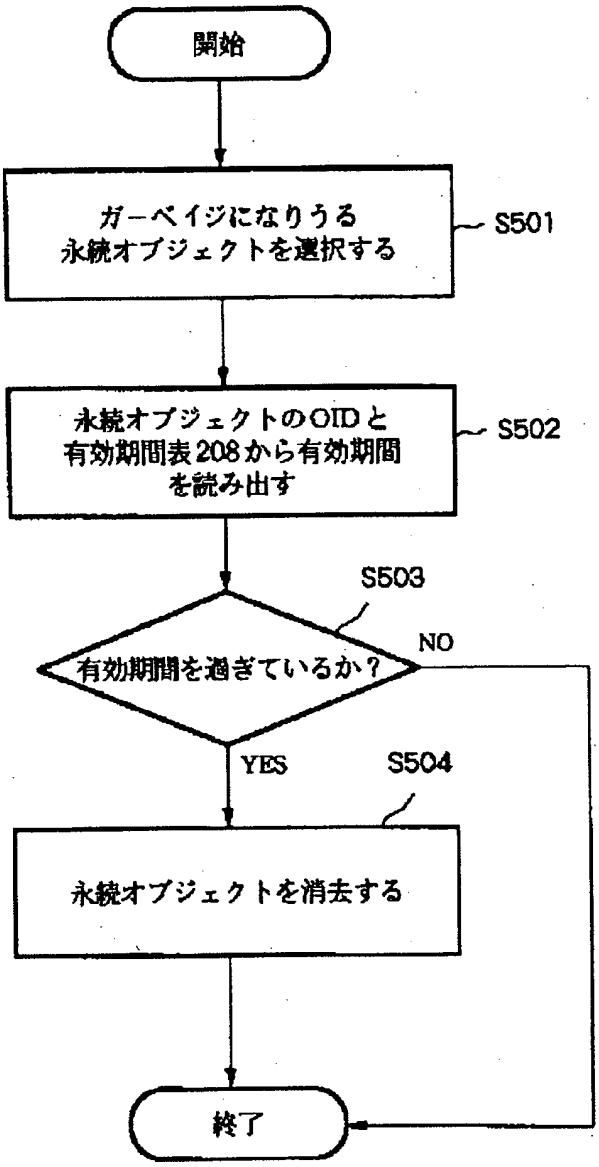
[Procedure amendment 3]
[Document to be Amended] DRAWINGS
[Item(s) to be Amended] drawing 2
[Method of Amendment] Modification
[Proposed Amendment]
[Drawing 2]



[Procedure amendment 4]
[Document to be Amended] DRAWINGS
[Item(s) to be Amended] drawing 3
[Method of Amendment] Modification
[Proposed Amendment]
[Drawing 3]

オブジェクト識別子	有効期間
OID1	平元年4月17日12時30分00秒～平2年9月10日12時30分00秒
OID2	－∞ ～平2年6月30日12時30分00秒
OID3	平3年5月1日22時30分00秒～＋∞
OID4	－∞～＋∞

[Procedure amendment 5]
[Document to be Amended] DRAWINGS
[Item(s) to be Amended] drawing 5
[Method of Amendment] Modification
[Proposed Amendment]
[Drawing 5]



[Translation done.]